

Action-Oriented Benchmarking *Market Research Survey Results*

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Results as of March 13, 2007

<http://energybenchmarking.lbl.gov/aob.html>

Strategy & Response

- 10-question web-based survey to assess:
 - Existing benchmarking practices
 - Features desired in action-oriented tool
- Broadcast to ~500 stakeholders across U.S.
 - Potential users of benchmarking tool, either as owners, tenants, or intermediaries
- 85 respondents btw Feb. 6 and March 13, 2007
 - Very good (17%) response rate; virtually all questions answered by each respondent
 - Respondents represent 555 million square feet of space directly influenced (plus 10's of billions indirectly)
 - Results very stable (unchanging with increased responses)

Respondents: bldg. owners/tenants

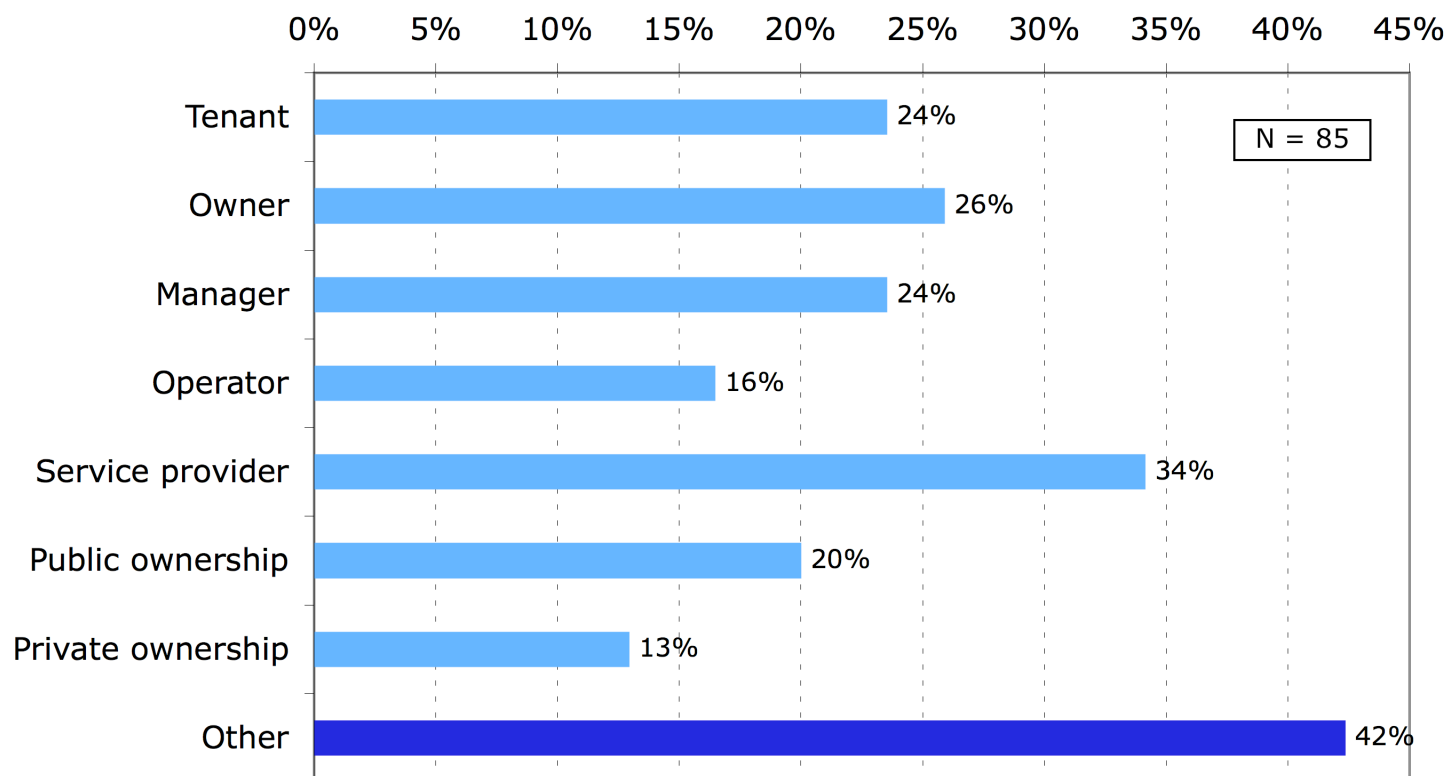
- Bayer
- CB Richard Ellis
- City of Lompoc
- City of Palo Alto
- City of Sacramento
- DC-DC Conversion
- Dell
- Fairchild Semiconductor
- Fed'l Energy Management Program
- HP
- HSBC
- Idaho National Laboratory
- Intel
- Jefferson Laboratory
- Johnson Controls
- Lawrence Livermore National Lab
- LBNL - Oakland Scientific Facility
- National Renewable Energy Lab
- Pfizer
- Princeton University DOE-PPPL
- Rittal Corporation
- Roche
- Salas O'Brien Engineers
- Sandia National Laboratory
- State of California - DGS
- Switch-and-data
- Thomas Properties Group
- UCSB
- USAA Real Estate
- US Department of Energy (facilities)
- US EPA (facilities)
- Verizon

Respondents: intermediaries

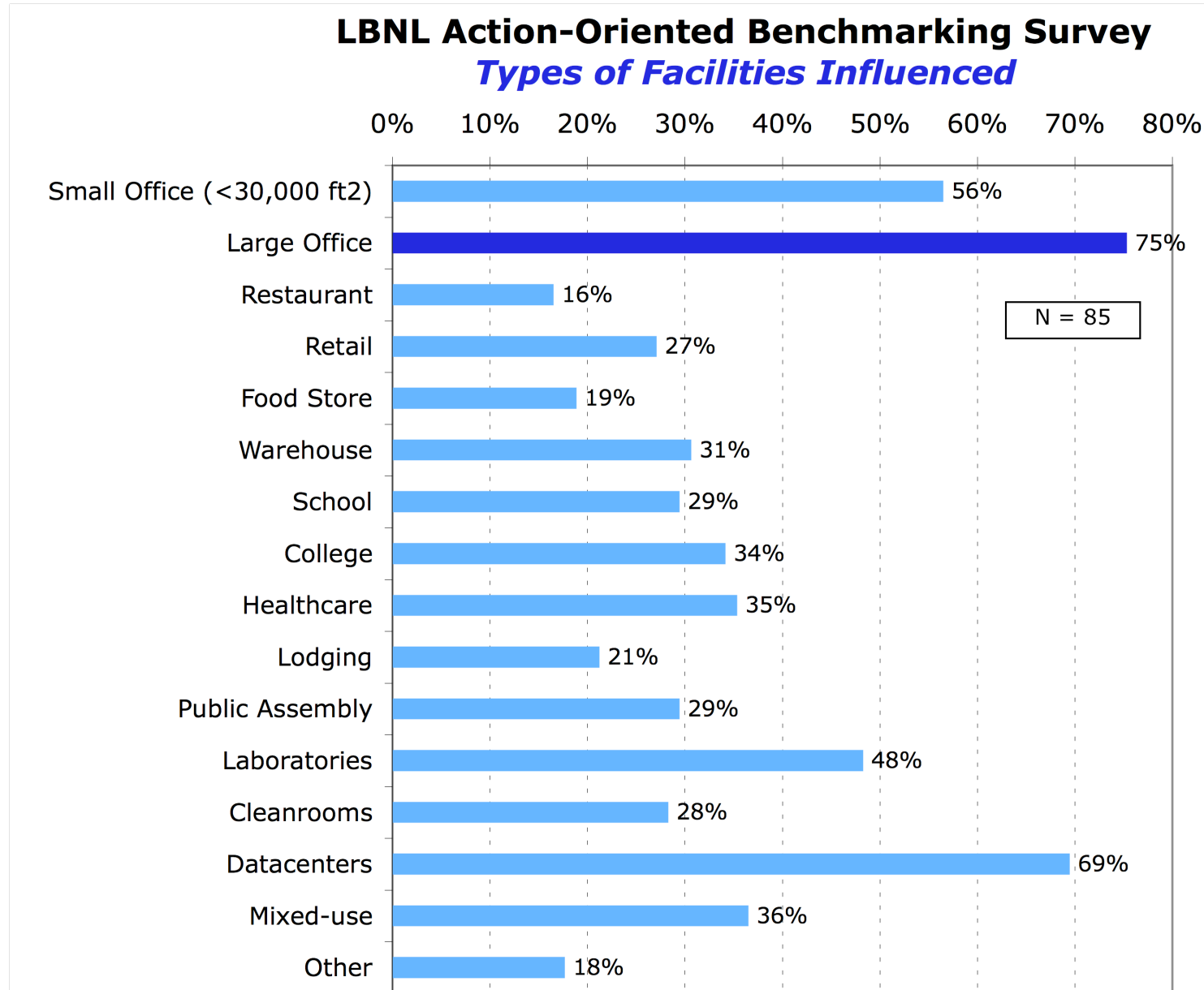
- American Power Conversion, Inc.
- Anagenesis, Inc.
- APS Energy Services
- CEC
- Cogent Energy
- Consortium for Energy Efficiency
- Cook Engineering, Inc.
- Critical Facility Associates
- Douglas Emmett, Inc
- Dranetz-BMI
- Energy and Technical Services
- Hammel, Green & Abrahamson
- Heshong Mahone Group
- Jones Lang LaSalle
- Kansas City Board of Public Utilities
- Lawrence Berkeley National Lab
- L&S Energy Services
- Lumina Decision Systems
- Minnesota Center for Energy Efficiency National Grid USA
- Natural Logic
- Northwest Alliance
- NW Energy Efficiency Alliance
- PECI
- PG&E
- Quantum Energy Services
- Rumsey Engineers
- San Diego Regional Energy Office
- Salas O'Brien Engineers
- San Francisco PUC
- SBW Consulting, Inc.
- Southern California Edison
- Sustainable Energy Partnerships (Adam Hinge)
- TIAXX, LLC
- TRC Construction

- All groups are well represented
- Service providers are largest user group
- Most users wear more than one "hat" (sum of values >> 100%)

LBNL Action-Oriented Benchmarking Survey *Ownership, Tenancy, or Service*

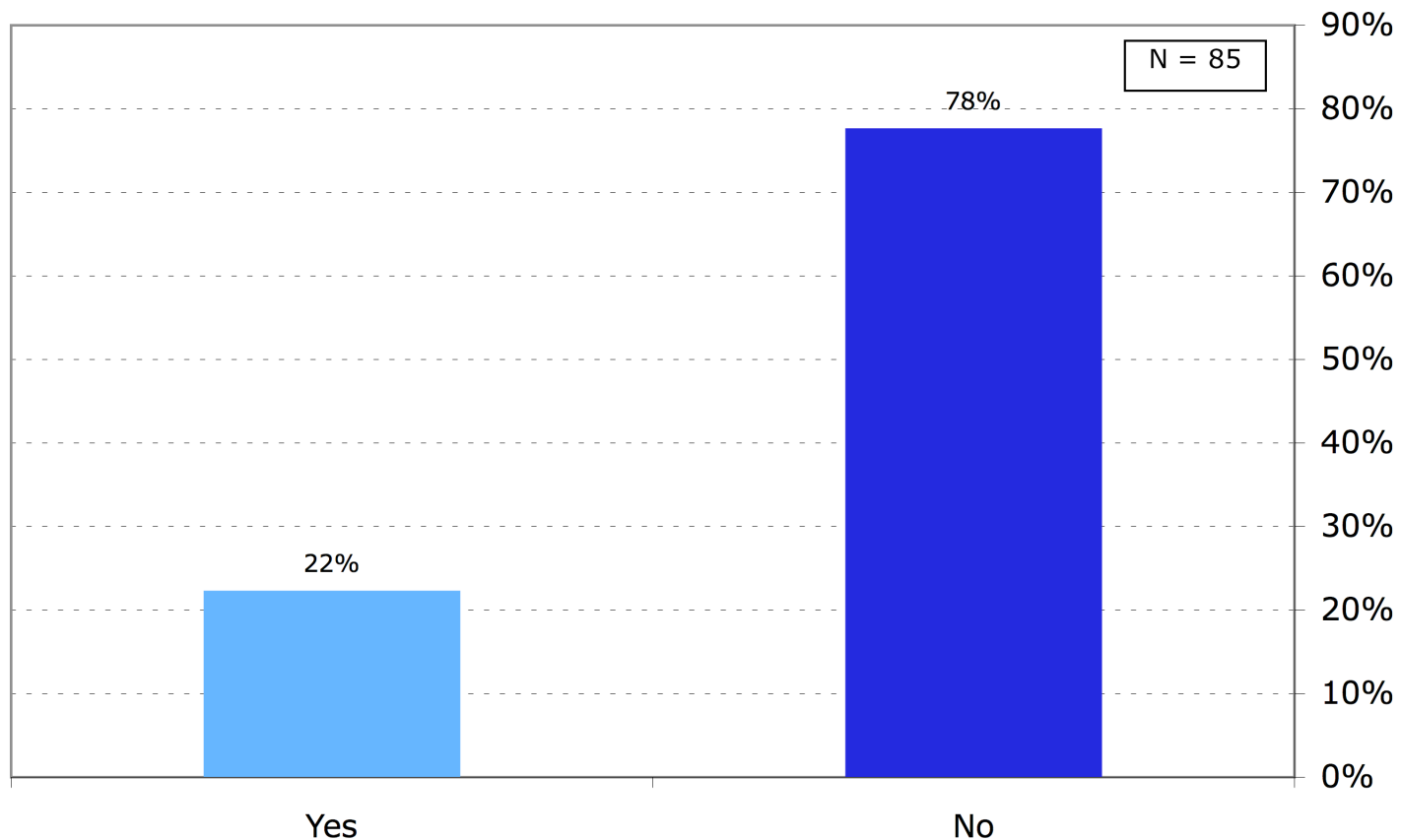


- Benchmarking is desired across bldg types
- Large offices are most commonly owned/operated/serviced facility
- Most users influence many types of buildings (sum of values >> 100%)



- About a quarter of respondents utilize non-energy benchmarking
- This group would presumably welcome consistency between their existing preferred metrics and energy benchmarking

LBNL Action-Oriented Benchmarking Survey
Current Non-Energy Benchmarking

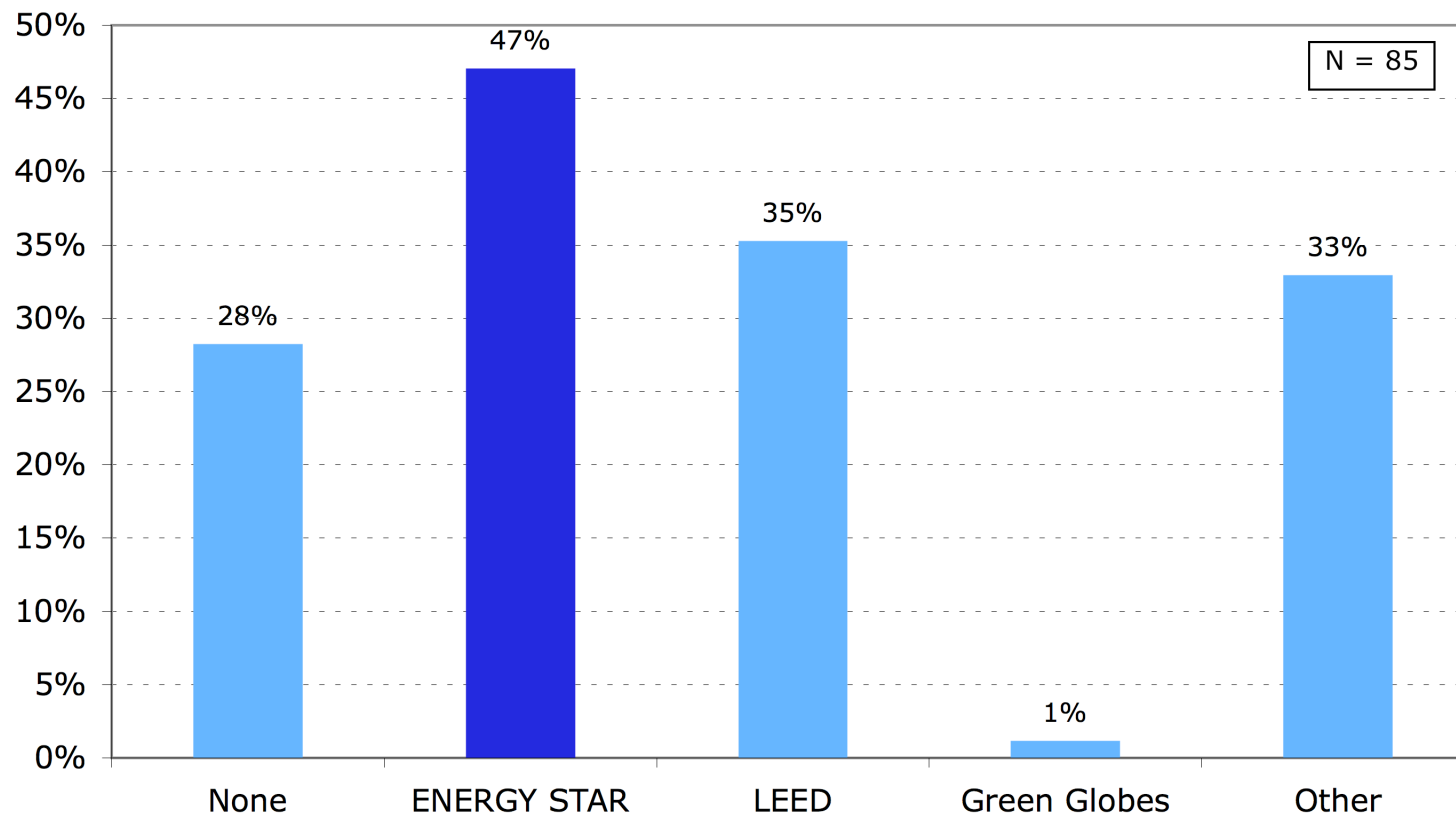


Non-energy benchmarks used

- Operating costs per SF, per employee
- Student density, building age, number of PCs
- Revenue per employee; revenue per square foot of factory floor space
- Sales per associate call
- Revenue and calls answered per associate
- Call-center tracking
- Functional costs
- Safety Performance (TRCR; DARTR)
- Maintenance costs per ft²
- Maintenance FTE per ft²
- Water, waste and carbon dioxide per m² and employee
- KPI - cost per m², cost per kWh of Energy, cost of fiber connection, cost of rack space occupancy indicators - rack density; server per rack; m² used vs m² available
- Sematech metrics (cleanrooms)

- Seven in ten conduct some sort of energy/sustainability benchmarking
 - One in three use something other than the "Big Three"
- People use more than one method, on average (sum of answers >

LBNL Action-Oriented Benchmarking Survey
Current Energy/Sustainability Benchmarking Method

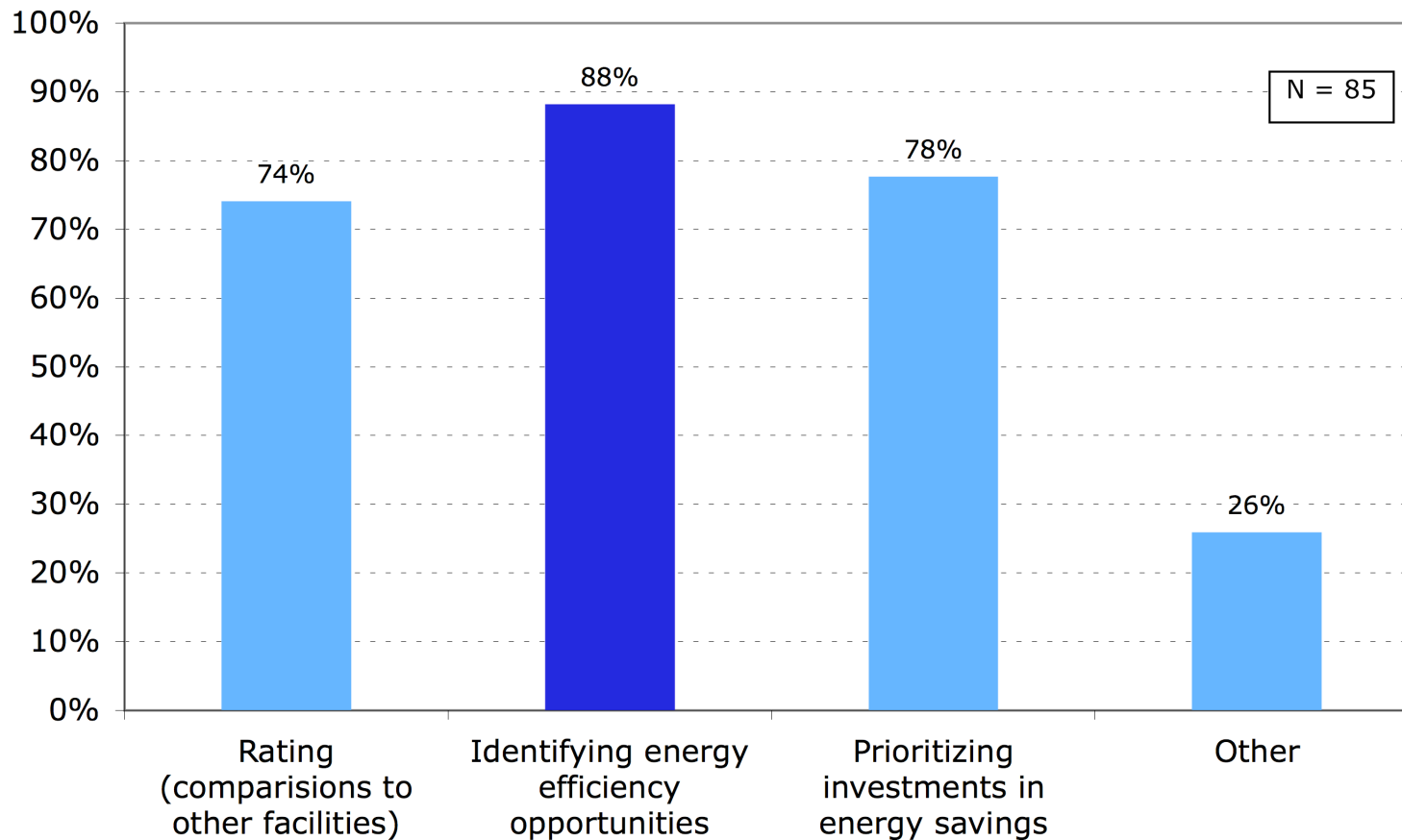


Other energy/sustainability benchmarks used

- HP in-house metrics
- BEPS
- Cal-Arch
- EUI compared to legislation, Executive Orders, Agency goals
- Client-specific applications (energy per sq.ft, tool, area, wafer, others)
- PIER work on high-tech facilities
- BREEAM; HK-BEAM
- Business Metabolics
- CustomNet
- Australian Building Greenhouse Rating Scheme National
Australian Built Environment Rating Scheme GreenStar
- In-house energy database
- e-Bench algorithms
- Guaranteed energy savings from modeling and utility bill analysis
- Old ORNL benchmarking data because we don't want to take the time to get owner's go-ahead to enter their data in Energy Star
- Sustainable business practices
- Good Steward Enterprise (FASER's replacement)
- In-house custom analysis of billing

- Users have a variety of uses for energy benchmarking

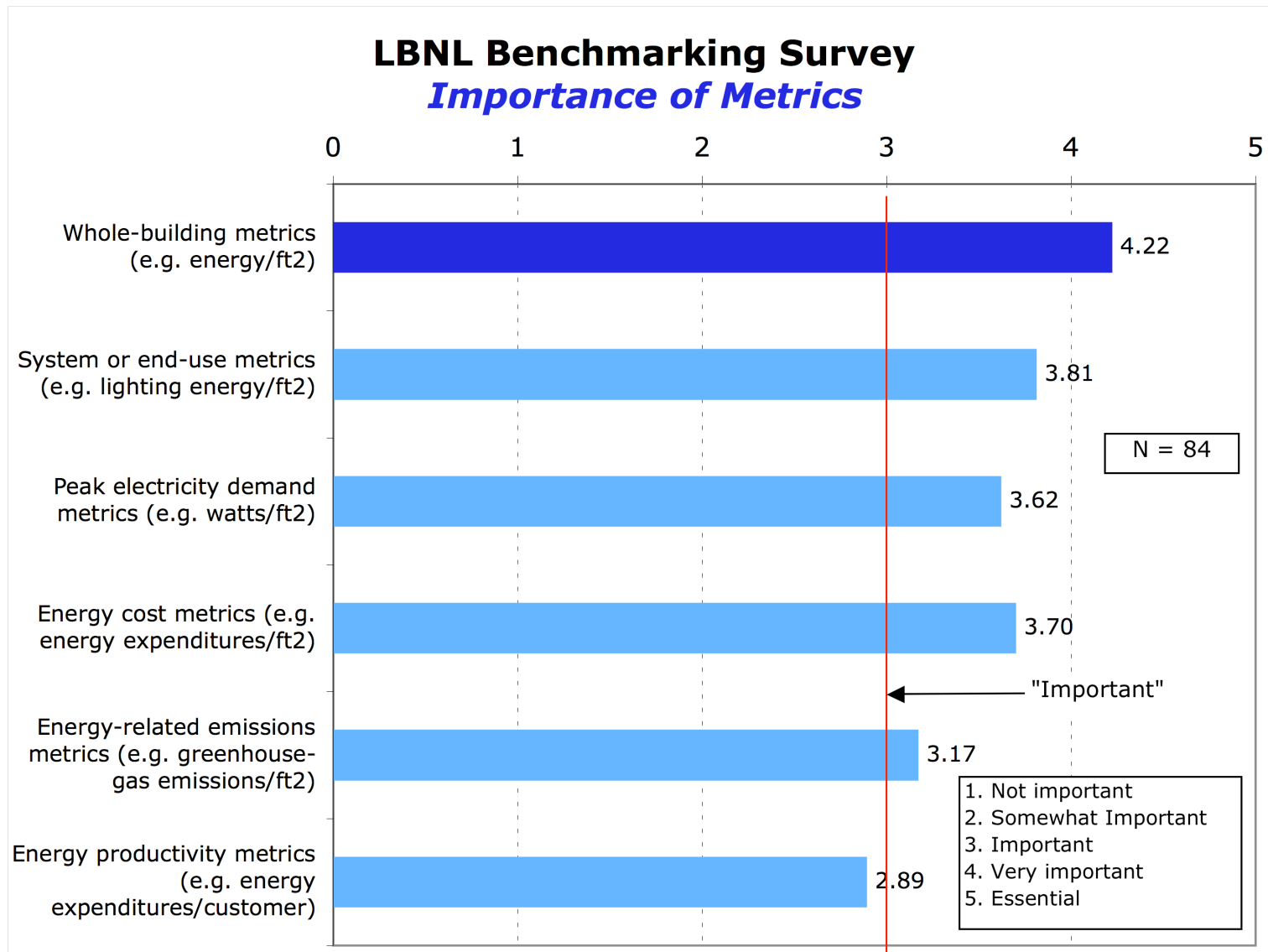
LBNL Action-Oriented Benchmarking Survey *Reasons for Energy Benchmarking*



Other reasons to benchmark

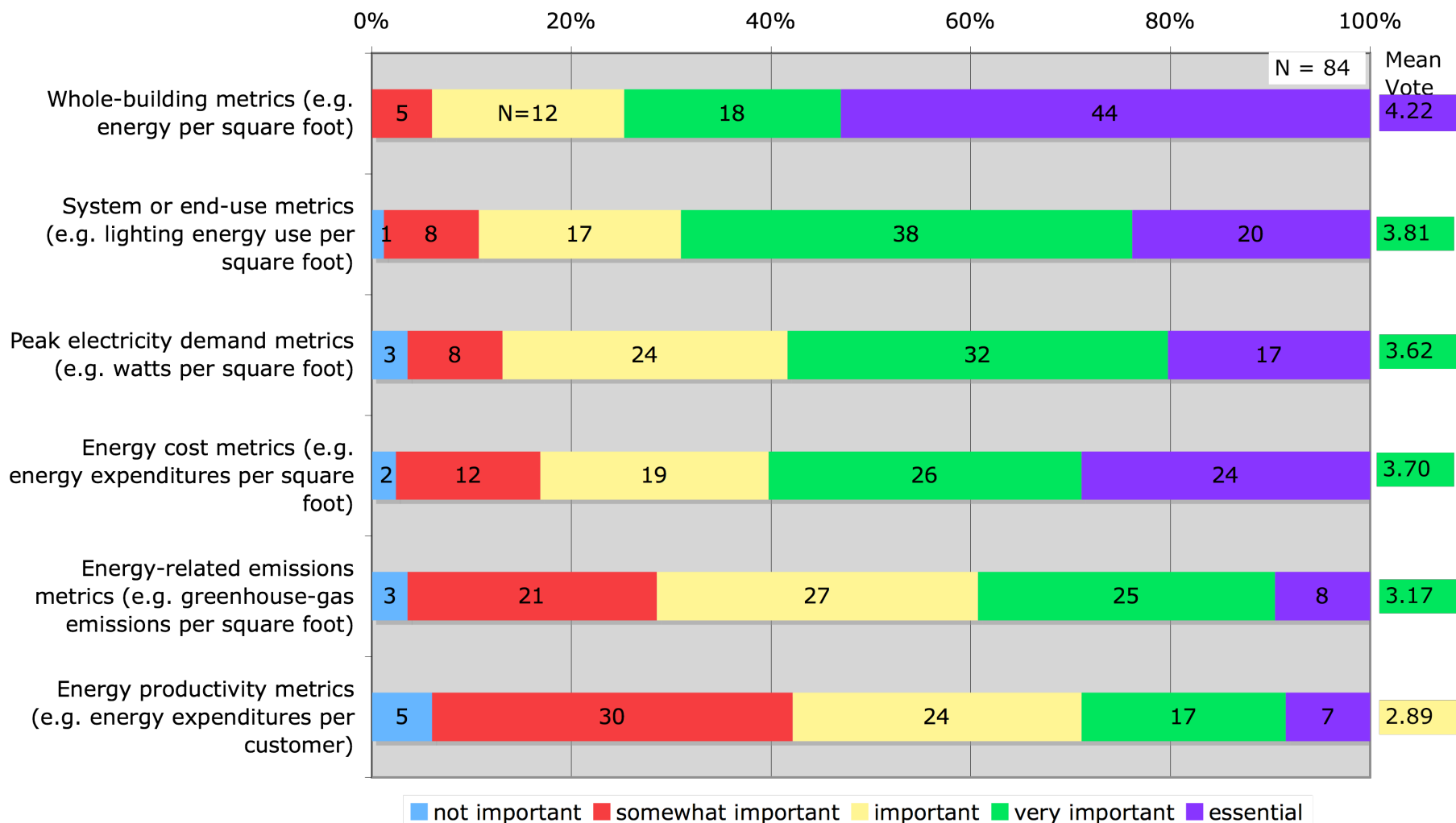
- Persistence metrics
- Market research
- Setting examples for the community to follow
- Encouraging participation in EE programs
- Savings verification
- Competitions
- Public relations / Corporate Social Responsibility
- Overall cost & upgrades reduction
- Track progress towards Executive Orders
- To encourage participation in utility programs
- Reducing utility costs
- Partnerships with power providers to save costs
- Obtain basis for business cases to invest in energy management

- A range of metrics are "important" or "very important" to users

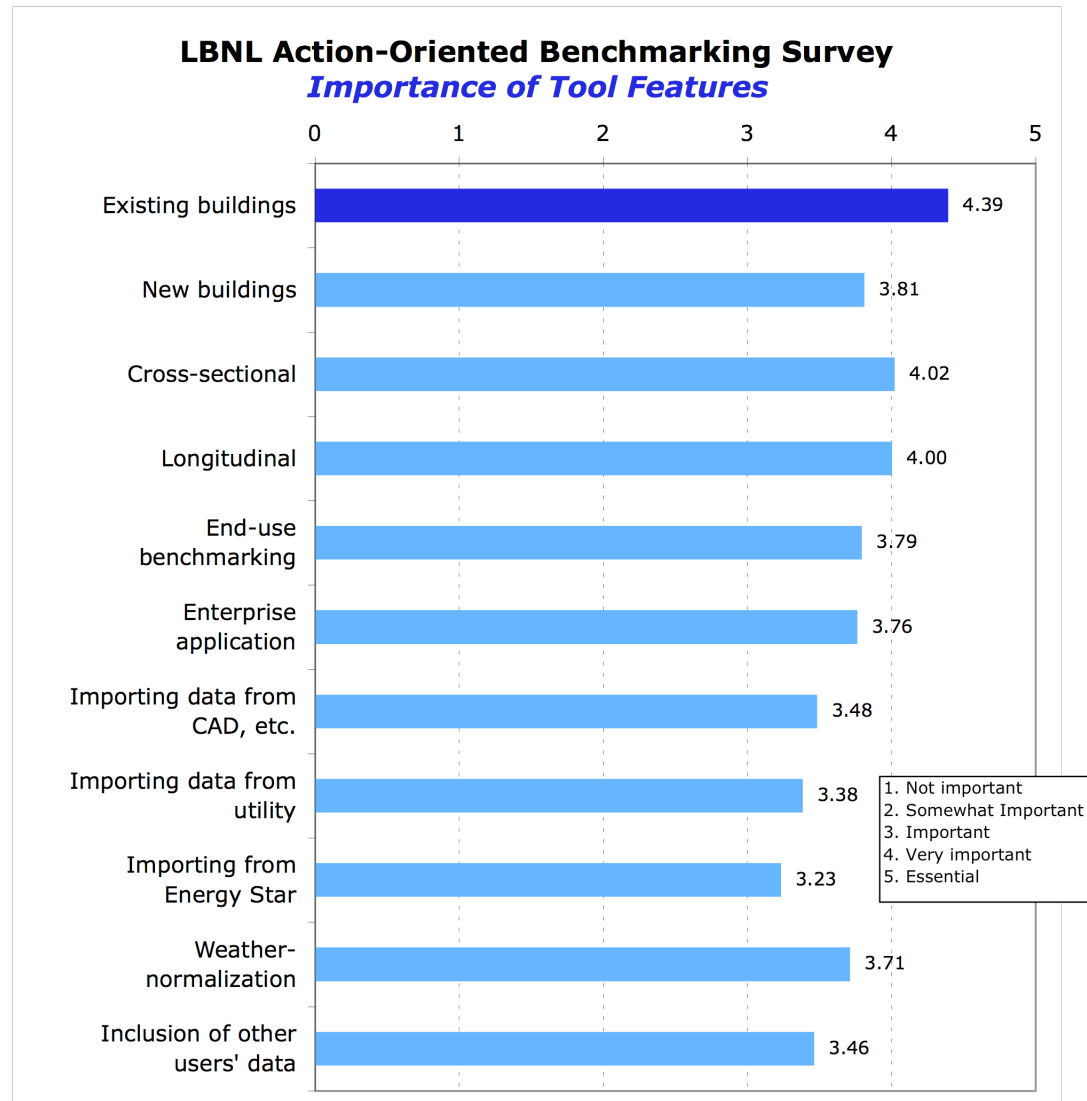


Data labels indicate number of responses for each interval

Rank the importance of the following general categories of energy benchmarking metrics.

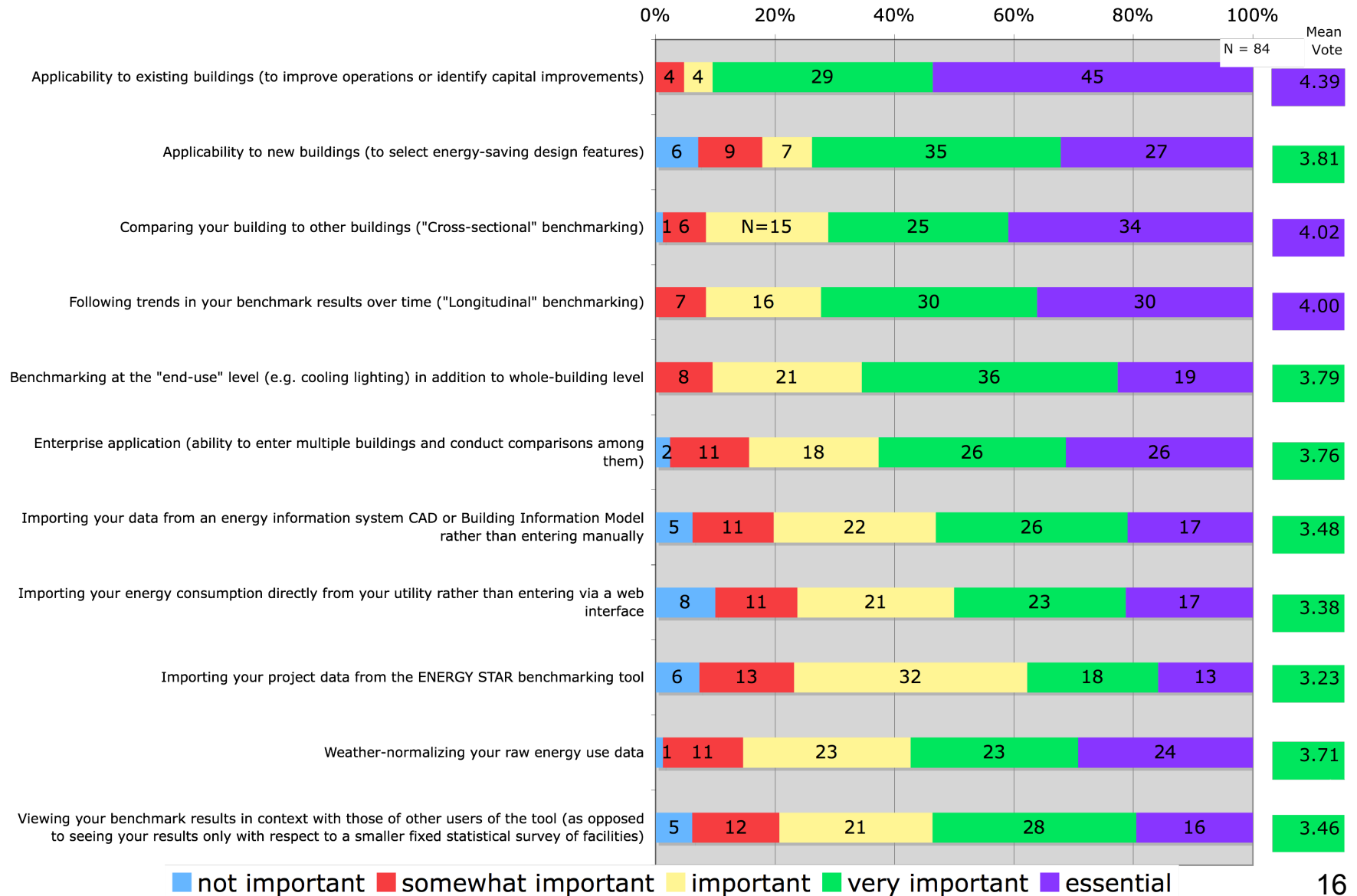


- Potential users desire various types of functionality in a tool
e.g. enterprise application, ability to import data
- Users desire various types of analysis in a tool
e.g. new and existing buildings, longitudinal and cross-sectional...
- Users want to see their result in context with other users' data



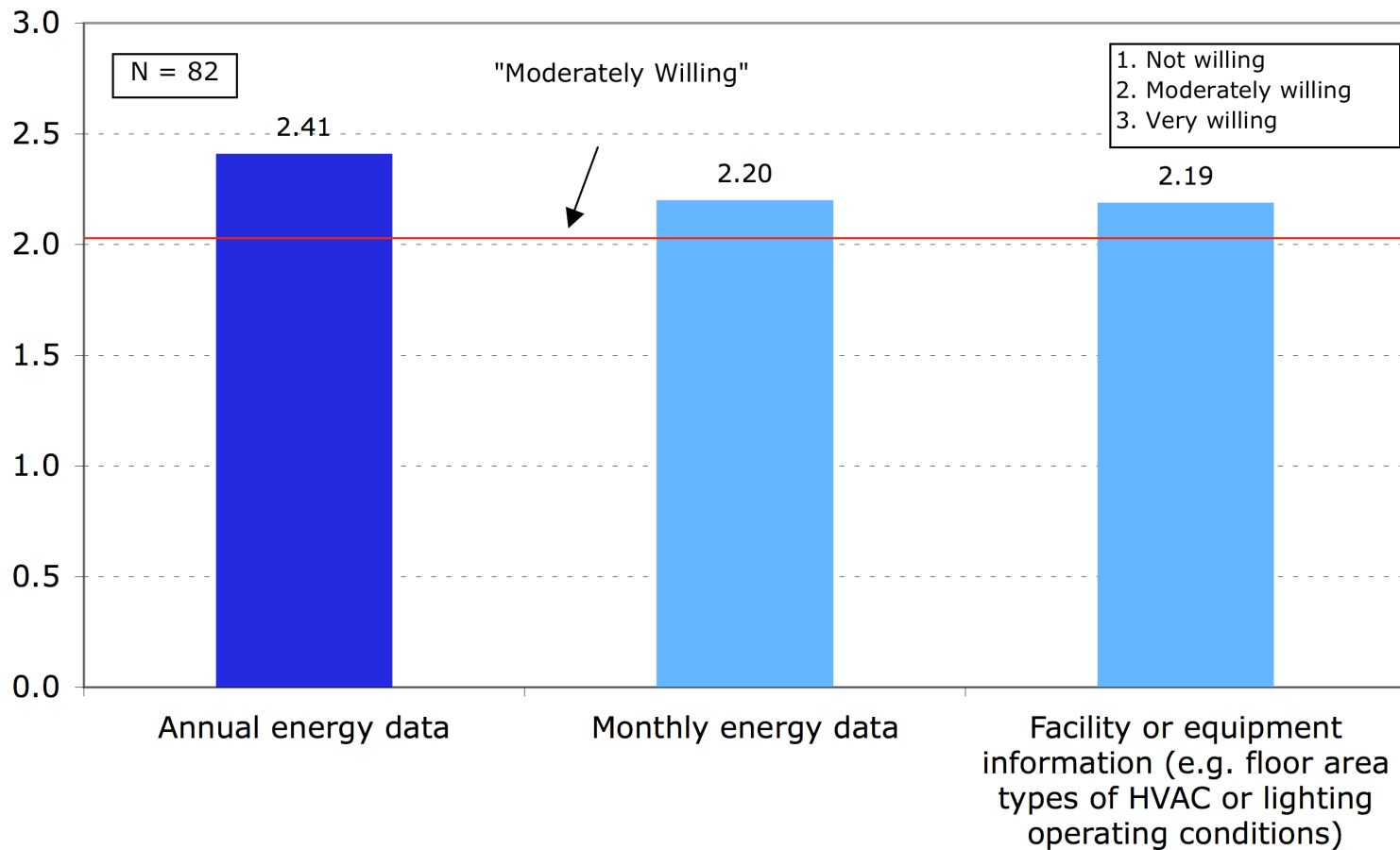
Data labels indicate
number of responses for
each interval

Rank the importance to you of the following possible energy benchmarking tool features.



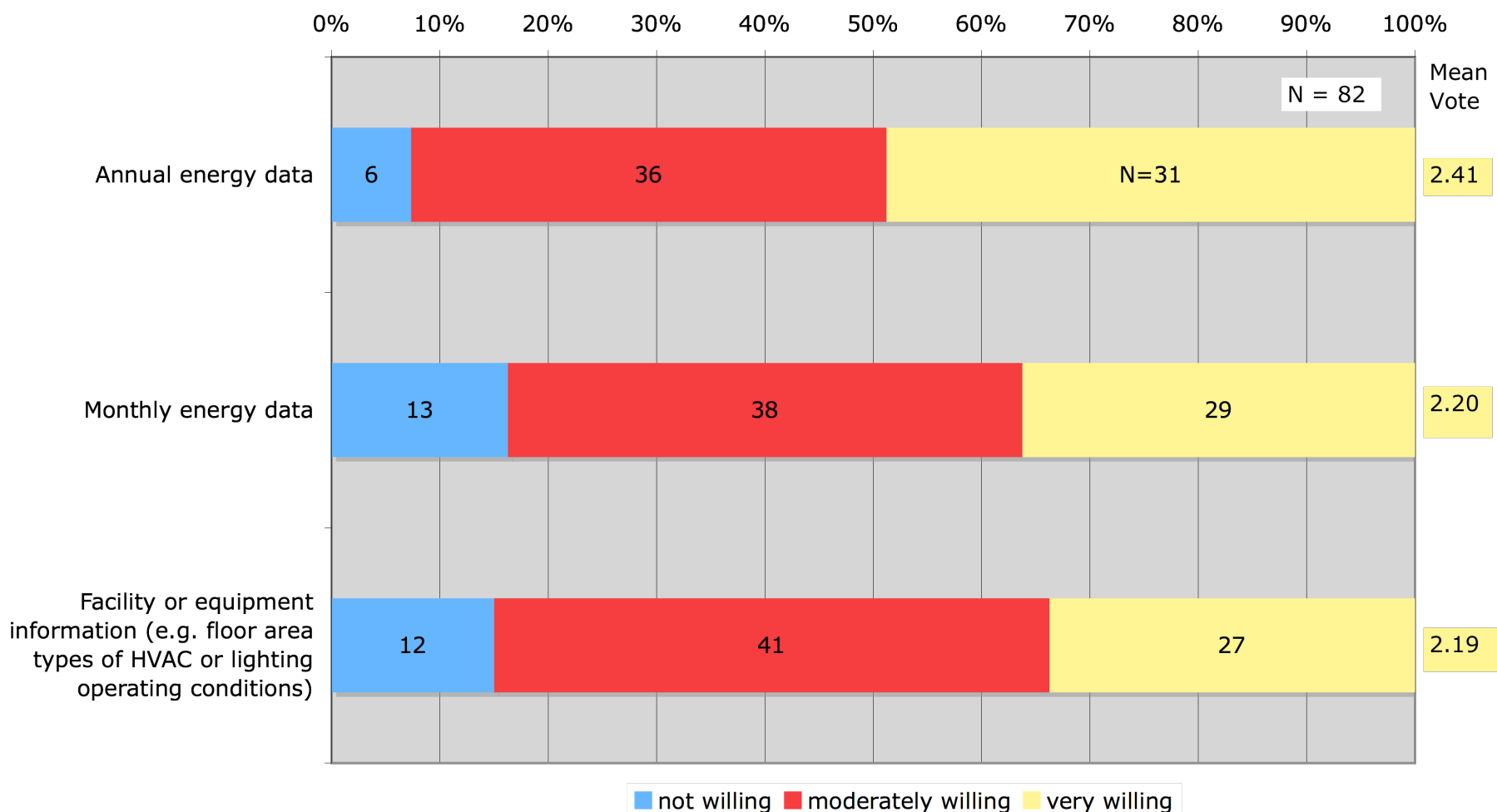
- Users are roughly equally willing to enter annual or monthly energy data as well as facility characteristics information
- 5% to 20% unwilling to enter data into *our* database

LBNL Action-Oriented Benchmarking Survey *Willingness to Provide Data*



Data labels indicate number of responses for each interval

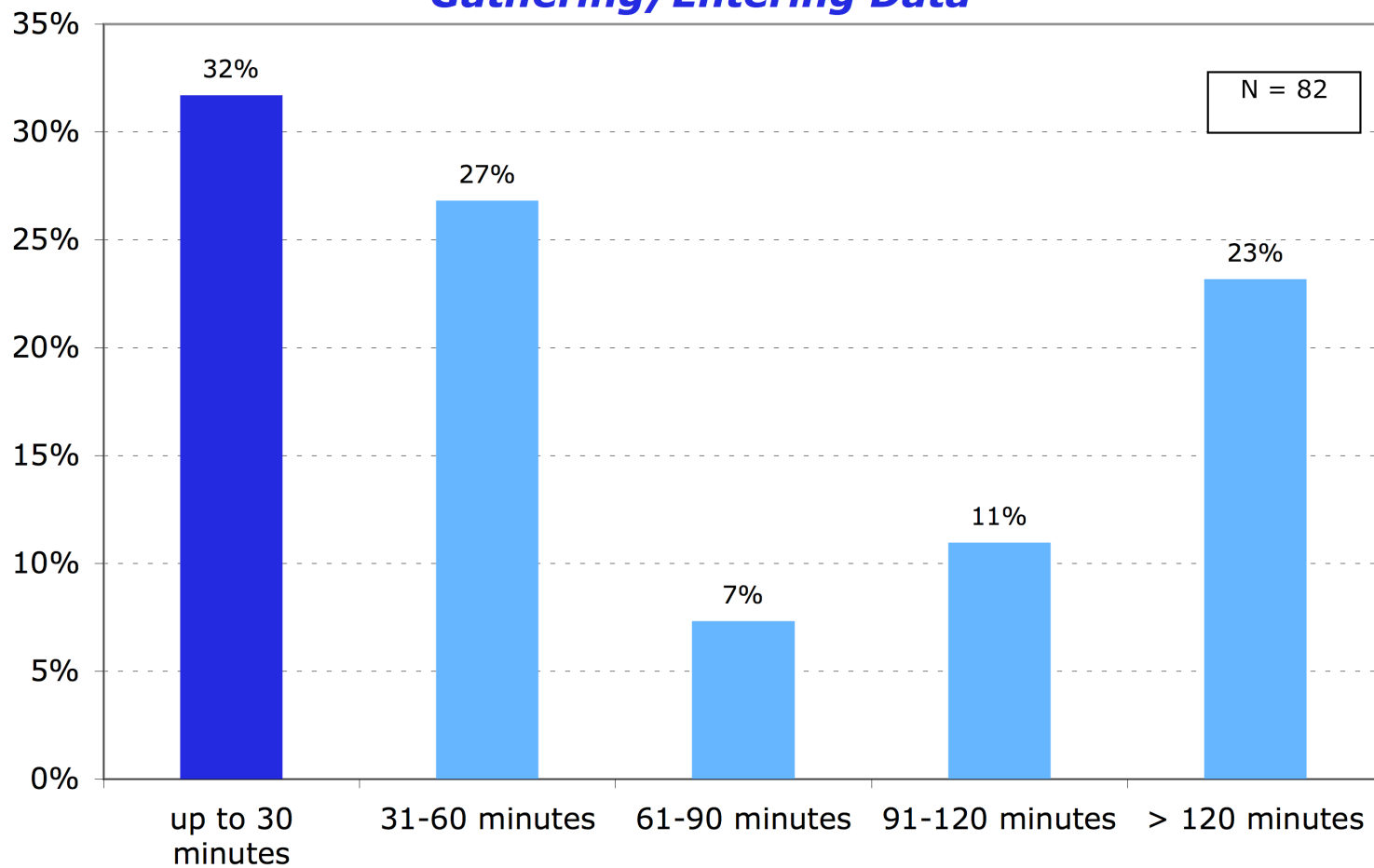
Please indicate your willingness to add your building to our database by using the action-oriented benchmarking tool for the purposes of energy benchmarking



- "Bi-modal" distribution suggests 2 groups: small/busy & dedicated
- One in three users will spend up to 30 minutes gathering and inputting
 - Another one in three will spend 30-60 minutes
 - One in four will spend more than two hours

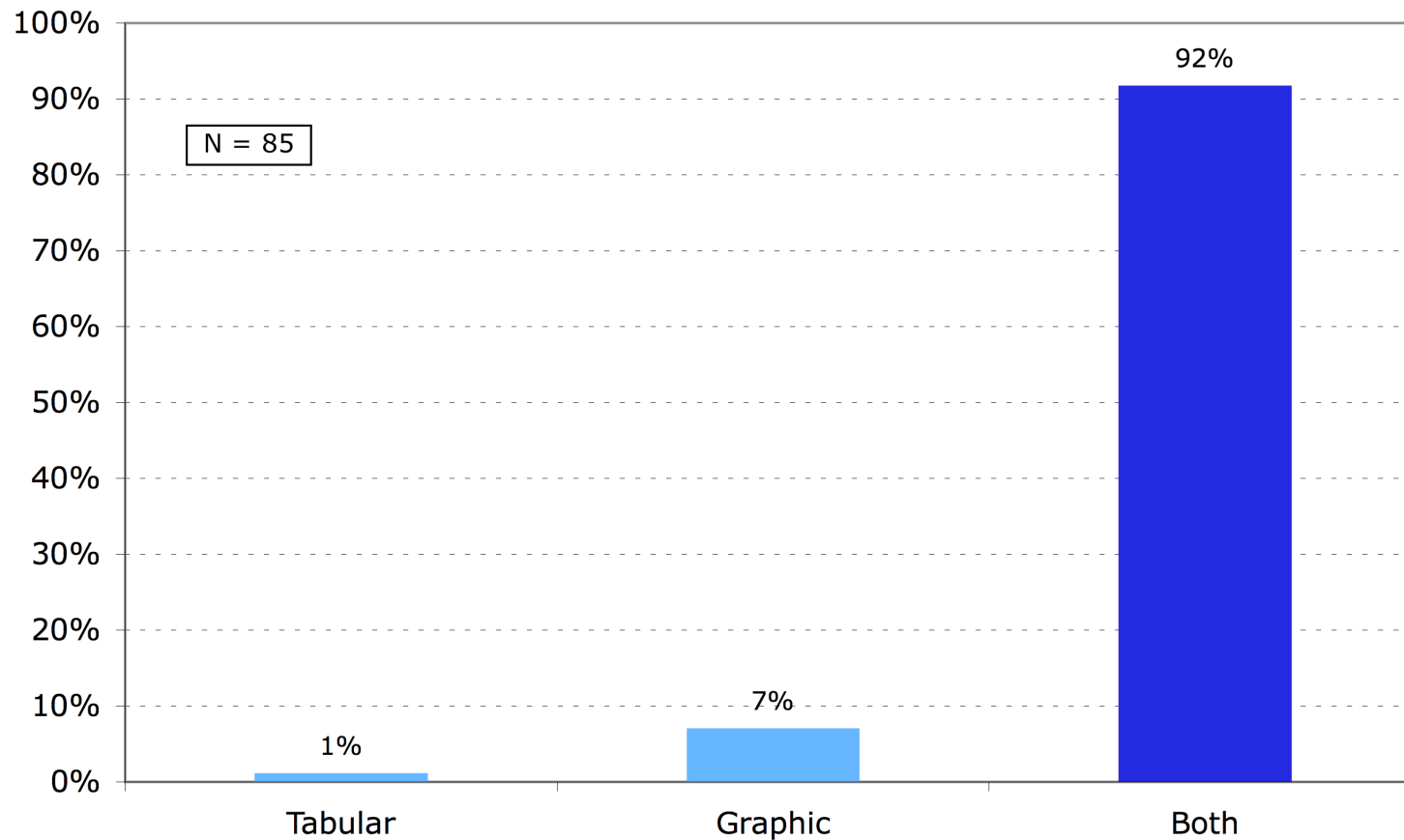
LBNL Action-Oriented Benchmarking Survey

Willingness to Spend Time Gathering/Entering Data

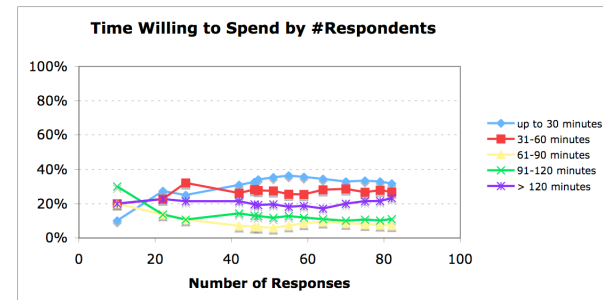
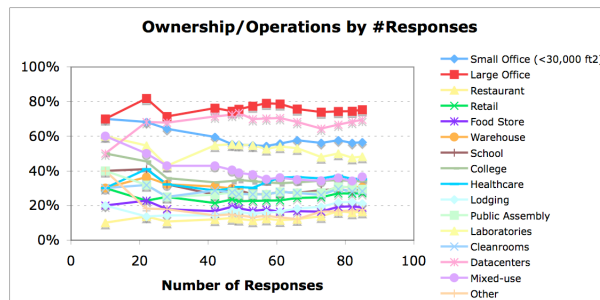
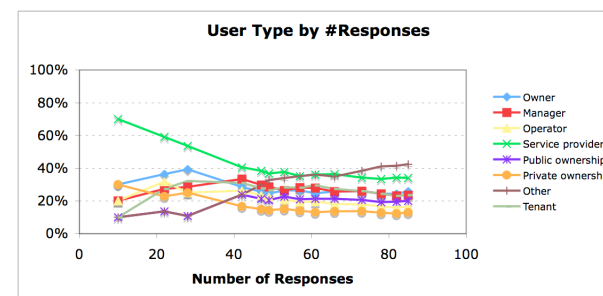
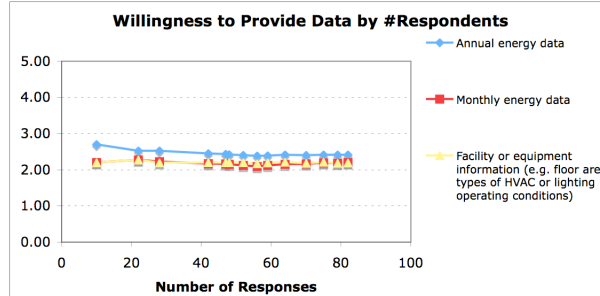
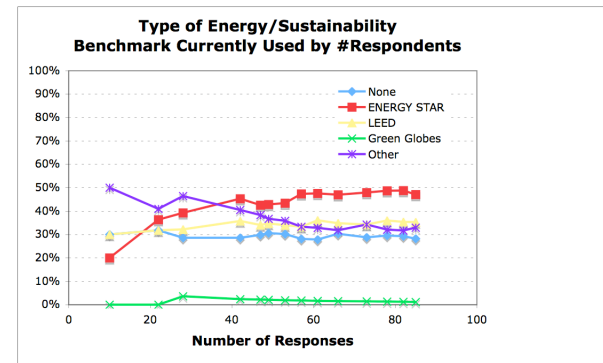
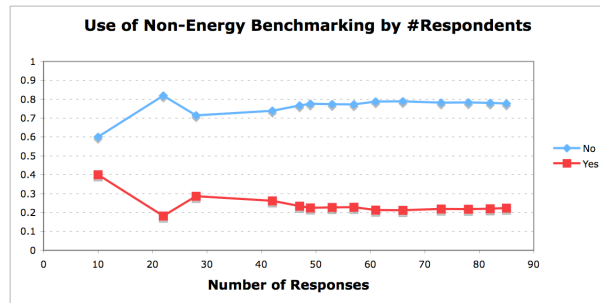
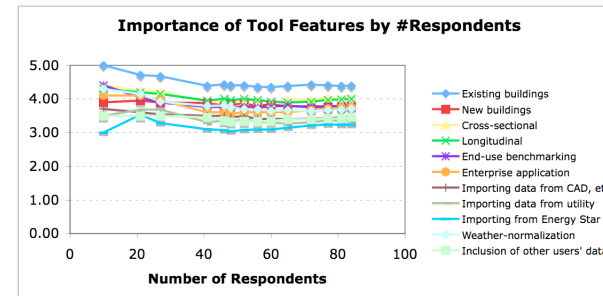
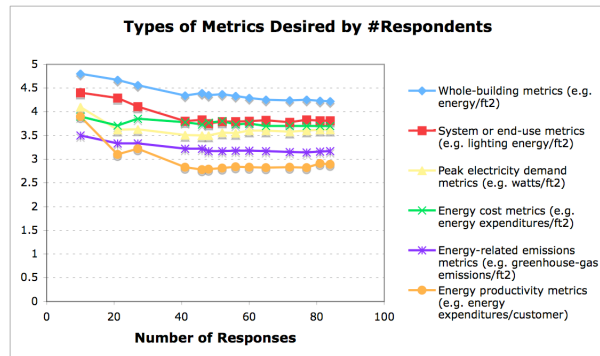


- Users are almost unanimous that they want BOTH tabular and graphical outputs

LBNL Action-Oriented Benchmarking Survey *Preferred View of Results*



Results Stable Over Time



Suggested Elements of Action-Oriented Tool

- Design
 - Most respondents deal with more than one building type
 - Onion approach (user selects level of detail) is important - many users have <30 min to invest; others >120 min
 - Almost all users want both graphic and tabular output
 - Allow for users to compare themselves to “official” data (e.g. CEUS) as well as other users
- Features
 - Benchmarking wanted for existing *and* new buildings
 - Longitudinal *and* cross-sectional both important
 - Range of metrics desired: let user select rather than pre-determining
 - Option to view results in context with legislative targets
 - Coordination with non-energy benchmarking metrics useful for at least 1 in 4 users
 - Enterprise applications strongly desired